

## **Marked-up Version of the Amended Claims:**

1. (Currently amended) A method of growing a Gallium Nitride on a silicon substrate, including the following steps:
  - (a) providing a silicon substrate ~~whereon Gallium Nitride is grown,~~,
  - (b) removing the oxide layer on said silicon substrate,
  - (c) growing a buffer layer of a Silicon Carbon Nitride by supplying a gas mixture of H<sub>2</sub>, SiH<sub>4</sub>, NH<sub>3</sub>, and C<sub>3</sub>H<sub>8</sub> to a reactor maintaining at a specified growing pressure and temperature, during a specified length of growing time,
  - (d) growing a Gallium Nitride film upon the said buffer layer of said Silicon Carbon Nitride by providing source materials into a reactor maintaining at a specified temperature, ~~and~~ pressure, with a specified rotating speed of said substrate.
2. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein the said silicon substrate is oriented in <100> or <111> direction.
3. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein the said silicon substrate is of either p-type or n-type, with a specific resistivity of any value.
4. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (b), the said oxide layer on the said silicon substrate is removed by a Rapid Thermal Chemical Vapor Deposition system.
5. (Currently amended) ~~A method of claim 1~~ The method of growing a

Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (b), the said oxide layer on the said silicon substrate is removed by a Chemical Vapor Deposition system,

6. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein the said C<sub>3</sub>H<sub>8</sub> gas is substituted by CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, or SiCH<sub>4</sub> gas,
7. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein the said NH<sub>3</sub> gas is substituted by N<sub>2</sub>,
8. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein each the flow rate of said H<sub>2</sub>, SiH<sub>4</sub>, NH<sub>3</sub>, and or C<sub>3</sub>H<sub>8</sub> gas depends on size of said reactor and gas pipe design of the said gases,
9. (Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step(c), the said growing pressure ranges from 0.1mTorr to 40Torr,
- 10.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (c), the said growing temperature ranges from 750°C, to 1500°C,
- 11.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein The the chemical composition of the said buffer layer of said Silicon Carbon Nitride ranges as: Si (1-x-y): 35-65 at.% , C (x) 0.1-25 at.% , N

(y) 30-60 at.% ;

12.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (c), the thickness of the said buffer layer of said Silicon Carbon Nitride increases with said growing time;.

13.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (c), the said buffer layer of said Silicon Carbon Nitride is grown by a Rapid Thermal Chemical Vapor Deposition system;.

14.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step(c), the said buffer layer of said Silicon Carbon Nitride is grown by a Chemical Vapor Deposition system;.

15.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (d), the said specified temperature ranges from 400°C to 1200°C;.

16.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (d), the said specified pressure ranges from 50Torr to 700Torr;.

17.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in the said step (d), the said specified rotating speed of said substrate ranges from 10 rpm to 1000 rpm;.

- 18.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein, in ~~the~~ said step (d), a Metalorganic Chemical Vapor Deposition is used to grow ~~said~~ a Gallium Nitride buffer layer in thickness of 100Å to 700Å at a lower temperature, and then to grow ~~formal~~ said Gallium Nitride ~~thin~~ film in thickness of 0.3µm to 5.5µm at a higher temperature.
- 19.(Currently amended) ~~A method of claim 18~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 18, wherein, said lower temperature ranges from 400°C to 800°C, and said higher temperature ranges from 900°C to 1200°C, and both said Gallium Nitride buffer layer and said Gallium Nitride film are grown at a pressure ranging from 50 Torr to 700 Torr,
- 20.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, wherein ~~the~~ said source materials include: N<sub>2</sub>, H<sub>2</sub>, SiH<sub>4</sub>, NH<sub>3</sub>, TMGa (TrimethylGallium), TEGa (TriethylGallium), TMAI (TrimethylAluminium), TMIn(TrimethylIndium), and CP<sub>2</sub>Mg (CycloPentadienyl Magnesium).
- 21.(Currently amended) ~~A method of claim 1~~ The method of growing a Gallium Nitride on a silicon substrate according to claim 1, whereby ~~the~~ a multiple-layered structure of Gallium Nitride/Silicon Carbon Nitride/Silicon substrate is fabricated.